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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/575,288

04/11/2006

Marcus Johannes Henricus Van Dal

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NXP, B.V.

NXP INTELLECTUAL PROPERTY DEPARTMENT

M/S41-SJ

1109 MCKAY DRIVE

SAN JOSE, CA 95131

EXAMINER

INGHAM, JOHN C

ART UNIT

PAPER NUMBER

2814

NOTIFICATION DATE

DELIVERY MODE

11/17/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

Office Action Summary	Application No. 10/575,288	Applicant(s) VAN DAL ET AL.	
	Examiner JOHN C. INGHAM	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-6 and 8-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 8-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 August 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendments to the claims and drawings, filed 7 August 2008 have been entered. The objection to the drawings has been withdrawn.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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5. Claims 1, 2, 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (US 5,686,324) and Chao.

6. Regarding claims **1, 2, 5, 6, 8 and 13**, Wang discloses in Fig 17-19 a semiconductor device and a method of manufacturing the device, with a substrate and a semiconductor body of silicon (200) which comprises a field effect transistor having a source region (230, N++ on left side) which borders on the surface of the semiconductor body and which is connected to a lower-doped, thinner source region extension (231, Fig 17 item N-) and having a drain region (230, N++ on right side) which borders on the surface of the semiconductor body and which is connected to a lower-doped, thinner drain region extension (231, Fig 17 item N-), which regions and extensions are of a first conductivity type (n type), and having a channel region situated between said regions and extensions, which channel region is of a second conductivity type (p type), opposite to the first conductivity type, and having a gate electrode (211) separated from the channel region by a dielectric region (209), characterized in that the source region and the source region extension, and the drain region and the drain region extension are in each case connected with each other via an intermediate region (229, Fig 19 item N+) of the first conductivity type, the thickness and doping concentration of which range between those of the region and the extension and which is formed by an ion implantation carried out at an acute angle (45°) with the normal to the surface, and further wherein a sloped spacer (226) of an electrically insulating material is situated on the semiconductor body on either side of the gate electrode and directly contacting the intermediate region (229) and the associated extension (231).

7. Wang does not specify wherein each of the gate electrode, the source region and the drain region being provided with a respective connection region containing a metal silicide. Chao teaches that a connection region to a gate, source and drain are formed of silicide in order to reduce resistance of interconnects (col 2 ln 44), characterized in that the connection region is recessed in the semiconductor body (see Fig 5i) and that the metal reacts with silicon to form the metal silicide. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the teachings of Chao on the device of Wang in order to reduce the resistance of the interconnects.

8. Regarding claim **4**, Wang discloses the device of claim 1. The claim language "the intermediate region is formed by means of ion implantation" describes a product by process. See MPEP 2113. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

9. Regarding claim **10**, Wang discloses the method of claim 5, characterized in that the source region and the drain region are formed by means of an additional ion implantation (implant 232), and the intermediate region is formed immediately before the formation of the source region and the drain region (col 8 ln1-3), and all these regions are tempered in the same heat treatment (annealing step, col 6 ln 10).

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10. Regarding claim **11**, Wang discloses the method of claim 5, wherein the source region extension and the drain region extension are formed by means of an additional ion implantation step (Fig 17).

11. Regarding claim **12**, Wang discloses the method of claim 8, wherein the angle is about 20 degrees to about 40 degrees (angle between 0 and 60 degrees, col 8 ln 5).

12. Claim **9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wang and Chao as applied to claim 5 above, and further in view of Yu.

13. Wang and Chao disclose the method of claim 5, and Wang further teaches that ion implantation should be carried out at a flux of 1×10^{14} at/cm² (col 8 ln 2). Wang does not specify that the implant energy be between 0.5 and 10 keV.

14. Yu teaches that an ion implant may be carried out with an energy of 1-5 keV for intermediate depth regions (see Fig 1 items 23 and 25, Fig 4 and Fig 5 area between 40 and 42, and col 5 ln 30). However, the implant energy would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F. 2d 454, 105 USPQ 233, 235 (CCPA 1955). Furthermore, the specification contains no disclosure of either the critical nature of the claimed dimensions of any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the Applicant must show that the chosen

dimensions are critical. See *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ 2d 1934, 1936 (Fed. Cir. 1990).

Response to Arguments

15. Applicant's arguments with respect to claims 1, 2, 4-6 and 8-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOHN C. INGHAM whose telephone number is (571)272-8793. The examiner can normally be reached on M-F, 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Howard Weiss/
Primary Examiner
Art Unit 2814

John C Ingham
Examiner
Art Unit 2814

/J. C. I./
Examiner, Art Unit 2814